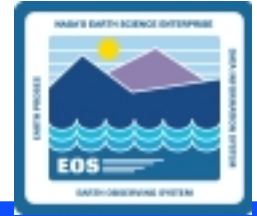


PROBLEM MANAGEMENT

ECS Release 5B Training

Overview of Lesson



- **Introduction**
- **Writing a Trouble Ticket (TT)**
- **Documenting Changes**
- **Problem Resolution**
- **Preparing a TT Telecon and Processing a TT through the Failure Review Process**
- **Making Emergency Fixes**
 - **Help Desk Triage Team**
- **Practical Exercises**
 - **Writing a Trouble Ticket**
 - **Documenting TT Changes**

Objectives



- **OVERALL:**
 - Develop proficiency in trouble ticketing and problem resolution procedures
- **SPECIFIC:**
 - Submit a trouble ticket (TT)
 - Make changes to an existing TT
 - Describe the steps in the routine problem resolution process
 - Describe the steps in preparing a TT Telecon and processing a TT through the problem resolution process
 - Describe the process of making emergency fixes
- **STANDARD:**
 - Mission Operation Procedures for the ECS Project - 611-CD-500-002

Importance

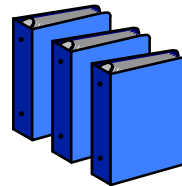
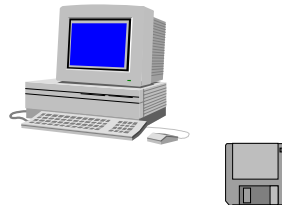


- All internal users of ECS are affected
- If a problem occurs with ECS hardware, software, documentation, or procedures, it is necessary to apply problem management tools and procedures

Writing a Trouble Ticket (TT)



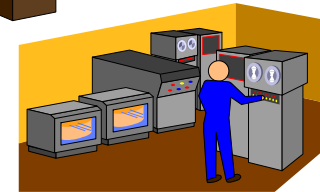
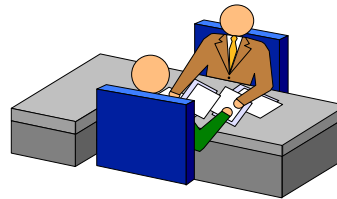
- **Electronic document for:**
 - Reporting/recording problems
 - Recording an idea for a system enhancement
- **Problems affect the following ECS components:**
 - hardware
 - software
 - technical documents
 - procedures



Writing a Trouble Ticket (Cont.)

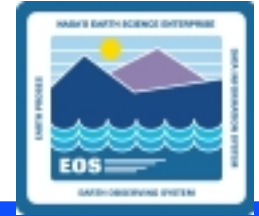


- **TTs are submitted by...**
 - users in the science community
 - ECS operators/staff
 - ECS developers



- **Trouble Ticket states:**
 - new
 - assigned
 - solution proposed
 - implement solution
 - solution implemented
 - closed
 - forwarded
 - work around
 - not repeatable

Writing a Trouble Ticket (Cont.)



- **If a configuration change is required, a Configuration Change Request (CCR) is prepared.**
 - provides documentation for the configuration management process
 - a TT leads to a CCR only when a configuration change is proposed

Writing a Trouble Ticket (Cont.)



- **ECS Trouble Ticketing System provides a consistent means of...**
 - reporting ECS problems
 - classifying problems
 - tracking the occurrence and resolution of problems

Writing a Trouble Ticket (Cont.)



- **Trouble Ticketing System**
 - managed by Remedy's Action Request System
 - provides Graphical User Interface (GUI)
 - provides a common entry format
 - stores TTs
 - retrieves TTs
 - transfers TTs between facilities
 - produces reports
 - provides e-mail interface (automatic notification)
 - provides application programming interface
 - provides summary information to SMC
 - defines TT "life cycle"
 - allows customized escalation and action rules

Writing a Trouble Ticket (Cont.)



- **Trouble Ticketing System - methods of submitting TTs or checking TT status:**
 - Remedy (Action Request System)
 - custom hypertext markup language (HTML) documents
 - text e-mail template
 - contacting a User Services representative at one of the DAACs
 - by telephone
 - in person

Writing a Trouble Ticket (Cont.)



- **User Services - Contact Log**
 - separate Remedy schema (GUI) for recording user contacts
 - clicking a button transfers data from the contact log to the appropriate fields on a trouble ticket form

Writing a Trouble Ticket (Cont.)



- **Writing/Submitting Trouble Tickets**
 - **external users**
 - HTML documents
 - e-mail template
 - contacting User Services
 - **internal operators and users**
 - Remedy Action Request System

Writing a Trouble Ticket (Cont.)



- **TTs are handled electronically**
 - common distributed-access database system
 - Remedy is the database tool
- **Supporting documentation must be handled separately**
 - not possible to attach a file in Remedy
 - via e-mail to the TT database administrator
 - sending/giving it to the TT database administrator
 - SMC Configuration Management (CM) Administrator
 - SEO/SOS Operations Readiness and Performance Assurance Analyst
 - DAAC Operations Readiness and Performance Assurance Analyst

Writing a Trouble Ticket (Cont.): Procedure



- **Access Remedy User Tool**
 - Follow procedure to access Remedy
- **Log in if first-time user**
- **Select RelB-Trouble Tickets Schema**
 - File menu
 - Open Schema
- **Select Open Submit**
 - File menu

Writing a Trouble Ticket (Cont.): Release B Trouble Tickets Schema



Action Request System — RelB-Trouble Tickets (tlmsh01)

File Edit Query Actions Macros Windows Help

Ticket-Id: [] Ticket Status: [Clear] Assigned-Priority: [Clear]

Short Description: [] Submitter Impact: [Clear]

Long-Description: []

Resolution Log (End User Sees): [] Detailed Resolution Log: []

Submitter ID: [] Assigned-To: [] Closing Code: []

Submitter Name: [] Last-Modified-by: [] Closed-by: []

Submitter Phone: [] Create-date: [] Close-date: []

Submitter eMail: [] Last-Modified-date: [] Software Resource: []

Submitter Home DAAC: [] Related CCR: [] Hardware Resource: []

History: [] Key Words: [] Hardware Information: []

CI: [] Problem Type: [] Duplicate Master Id: []

Associated Contact Log Id: []

Goto Contact Log

List All Masters

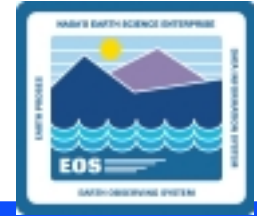
List This TT's Duplicate(s)

Query: []

Fields: []

These entries may not appear on your window, depending on your assigned authorizations.

Writing a Trouble Ticket (Cont.): “Open Schema” Window



Open Schema

Available Schemas

- Group (t1msh01)
- RelB-Contact Log (t1msh01)
- RelB-Hardware Information (t1msh01)
- RelB-Menu-Closing Codes (t1msh01)
- RelB-Menu-Hardware Resources (t1msh01)
- RelB-Menu-Key Words (t1msh01)
- RelB-Menu-NotifyGeneral (t1msh01)
- RelB-Menu-Problem Type (t1msh01)
- RelB-Menu-Software Resources (t1msh01)
- RelB-Software Information (t1msh01)
- RelB-TT-ForwardToSMC (t1msh01)
- RelB-TT-ForwardToSMCOld (t1msh01)
- RelB-TT-ForwardToSite (t1msh01)
- RelB-TT-NSI (t1msh01)
- RelB-TT-Sites (t1msh01)
- RelB-TT-Times (t1msh01)
- RelB-Trouble Tickets (t1msh01)
- SBenSchm (t1msh01)
- Test Schema (t1msh01)
- Test Schema 2 (t1msh01)
- Trouble-Ticket-Xfer (t1msh01)
- User (t1msh01)

* indicates a server that is not reachable

Selection

Note: Not all choices may appear on your window, depending on your assigned authorizations.

Writing a Trouble Ticket (Cont.): Trouble Ticket “Submit” Window



Submit --- ReIB-Trouble Tickets (tlmsh01)

Ticket-Id: VATC Ticket Status: New Assigned-Priority: []

Short Description: [] Submitter Impact: Low

Long-Description: []

Resolution Log (End User Sees): [] Detailed Resolution Log: []

Submitter ID: [] Assigned-To: [] Closing Code: []

Submitter Name: [] Last-modified-by: [] Closed-by: []

Submitter Phone: [] Create-date: [] Close-date: []

Submitter eMail: [] Last-Modified-date: [] Software Resource: []

Submitter Home DAAC: [] Related CCR: [] Hardware Resource: []

History: [] Key Words: [] Hardware Information: []

CI: [] Problem Type: [] Duplicate Master Id: []

Forward Closed TT to SMC: []

Forward Open TT To A Site: []

Forward-to: []

Forwarded-from: []

Forwarded-by: []

Forward-date: []

Unique-Identifier: []

Forwarded-to-1: []

Forwarded-to-2: []

Forwarded-to-3: []

Forwarded-to-4: []

Associated Contact Log Id: []

Goto Contact Log: []

List All Masters: []

List This TT's Duplicate(s): []

Apply Clear Set to Defaults Dismiss

These entries may not appear on your window, depending on your assigned authorizations.

Writing a Trouble Ticket (Cont.): Procedure



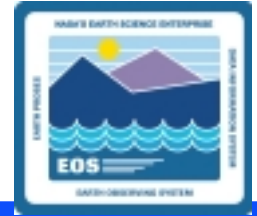
- **Type a short description of the problem**
 - Short Description field
- **Fill in Submitter ID**
 - Submitter ID field
 - Use pick-list
- **Select Submitter Impact**
 - High, Medium or Low
 - Optional
 - Low is default

Writing a Trouble Ticket (Cont.)



- **Fill in optional data:**
 - Long Description
 - Software Resource
 - Hardware Resource
- **Verify data**
- **Submit the TT**
 - click on the Apply button
 - confirmation message appears at bottom of window
 - Remedy also sends confirmation by e-mail

Writing a Trouble Ticket (Cont.)



- **Exit from the Remedy Action Request System**
 - Dismiss button
 - File menu
- **Send backup information/documentation to the TT database administrator**
 - send e-mail cover message
 - identify TT number
 - provide Submitter ID
 - include relevant information concerning attachments

Documenting Changes



- **Trouble tickets are modified at various stages of problem resolution, for example:**
 - assignment to a technician for problem resolution
 - resolution log entries
 - changes of status
 - forwarding to another site
- **Access privileges**
 - controlled by the database administrator
 - determine which TT fields an operator/user may modify

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **Access Remedy User Tool**
 - Follow procedure to access Remedy
- **Select RelB-Trouble Tickets Schema**
 - File menu
 - Open Schema
- **List TTs**
 - Query menu

Documenting Changes (Cont.): Trouble Ticket “Query List” Window



Query List --- ReIB-Trouble Tickets (g0msh08)

Query Actions

Matching entries:

GSF0000000000003 ECS Problem for Training

Number of matching entries : 1 (11/13/97 15:25:26)

Poll ☒ Off ☐ On 10 Minutes

Refresh Dismiss

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **Highlight/select the TT to be reviewed/modified**
- **Select Modify Individual**
 - Query menu
- **Review/Modify TT fields**
- **If forwarding the TT:**
 - set Ticket Status at Forwarded
 - select (from pick-list) the center to receive the TT
 - click on the Forward button

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **Apply changes**
 - click on the Apply button
- **Exit from the Remedy Action Request System**
 - Dismiss button
 - File menu

Problem Resolution



- **Overview of Problem Resolution**
 - **Every trouble ticket (TT) is logged into the Remedy database for record-keeping purposes**
 - **Each TT is evaluated first at the local center**
 - **determine the severity of the problem**
 - **assign on-site responsibility for investigating the problem**
 - **TTs that can be resolved locally are assigned and tracked at the local center**

Problem Resolution (Cont.)



- **Overview of Problem Resolution (Cont.)**
 - **System-level problems or those that cannot be resolved locally are escalated to the agenda of the trouble ticket teleconference (“TT Telecon”)**
 - **sponsored by the Maintenance & Operations (M&O) organization**
 - **held daily**
 - **functions as the review forum for ECS failures or malfunctions**
 - **participants discuss TTs referred from the sites to the System Monitoring and Coordination Center (SMC) and coordinate TT activities within the M&O organization as well as with development, customer, and user organizations**

Problem Resolution (Cont.)



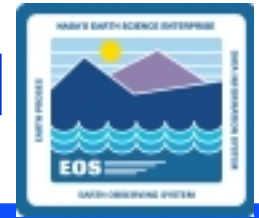
- **Operations Supervisor reviews TTs and assigns rating based on perceived impact**
- **TT Telecon subsequently assigns maintenance priorities by triage**
- **Triage system of maintenance priorities**
 - **system for assessing adverse effects on mission success on the basis of the following factors:**
 - **scope of the problem's effects (impact)**
 - **frequency of occurrence**
 - **availability of an adequate work-around**

Problem Resolution: Priorities



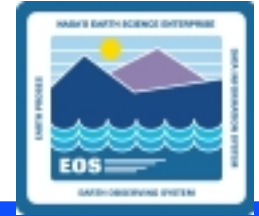
As Documented in NASA 420-05-03	As Used/Interpreted by M&O
<p>Category 1: System/Service cannot perform critical function or imposes major safety hazard. (Priority 1)</p> <p>Presents an immediate impact to development, operations, services, or data processing functions; imposes major safety hazard to personnel, systems, or space mission resources; or results in loss of one or more essential mission objectives.</p>	<p>HIGH (Priority 1): An NCR for which no work-around exists <u>or</u> an NCR for which no workaround can be accommodated by DAAC operators given a detailed workaround procedure is documented but the procedure is inadequate based upon the complexity of the procedure, the abilities of an adequately trained and experienced operator, or both; <u>and</u> the consequence of the occurrence causes:</p> <ul style="list-style-type: none"> – the unrecoverable loss of data, – the system to be unable to ingest, process, or distribute data, – the system to be unable to support user searches for available data, or – the operator to be unable to startup, shutdown or determine the status of system components.
<p>Category 2: System/Service substantially impaired. (Priority 2)</p> <p>Substantially impacts development, operations, services, or data processing functions; fails to operate within critical performance specifications; or cannot effectively or efficiently fulfill baseline requirements.</p>	<p>MEDIUM (Priority 2): An NCR for which a workaround exists <u>but</u> the frequency of occurrence is expected to be more than approximately once per day, the occurrence cannot be anticipated, <u>and</u> the impact is such that system performance is degraded to a point that there is reasonable risk that 24 hours of work cannot be accommodated within a 24 hour period.</p>
<p>Category 3: System/Service slightly impaired. (Priority 3)</p> <p>Causes minor or no substantial impact to development, operations, services, or data processing functions. Support may be degraded, but mission can still be accomplished.</p>	<p>Priority 3: Every other kind of problem (System/Service slightly impaired).</p>
	<p>Priority 4: Improvement (Nuisance; e.g., a typo).</p>
	<p>Priority 5: Enhancement (Identified for next release).</p>

Problem Resolution: TT Review Board



- **Each site establishes TT Review Board (TTRB)**
 - Considers problems and proposed solutions
 - Reviews/approves locally assigned priorities
 - Remedy (TT tool) uses *high, medium, and low* priorities
 - Adjudicates trouble tickets within limits of its authority
 - Refers high-priority TTs to SMC and TT Telecon
 - Manages medium-priority TTs
 - Medium- and low-priority TTs typically handled locally
 - Problems that affect multiple sites forwarded to SMC
 - Generates CCR for system enhancements
 - Issues implementing instructions for locally-handled TTs
 - Directs closure of TTs for locally fixed and verified problems

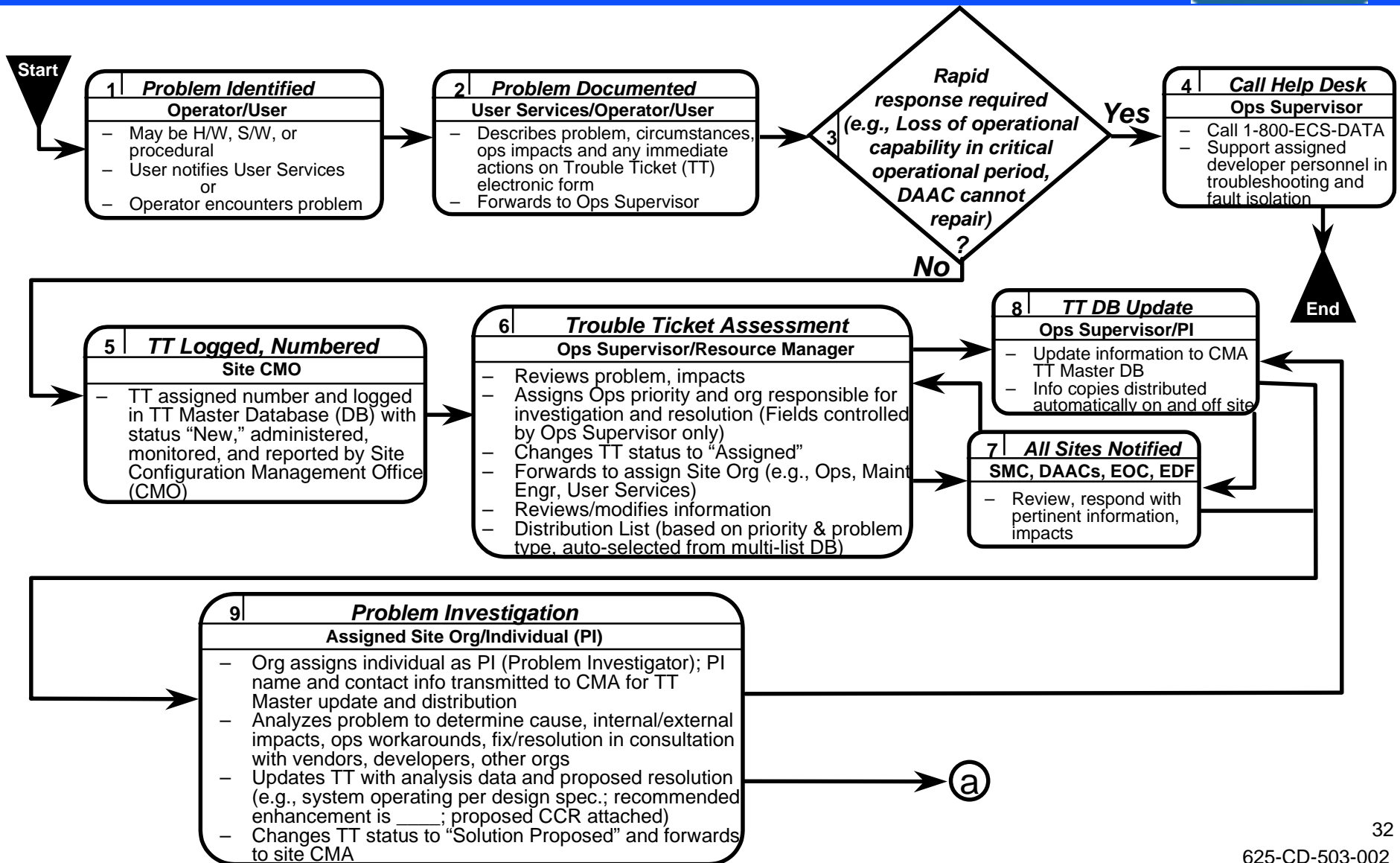
Problem Resolution: TT Telecon



- **TT Telecon**
 - reviews high-priority TTs
 - acknowledges TTRB response to medium-priority problems
 - coordinates TT activities within M&O and with development, customer and user organizations

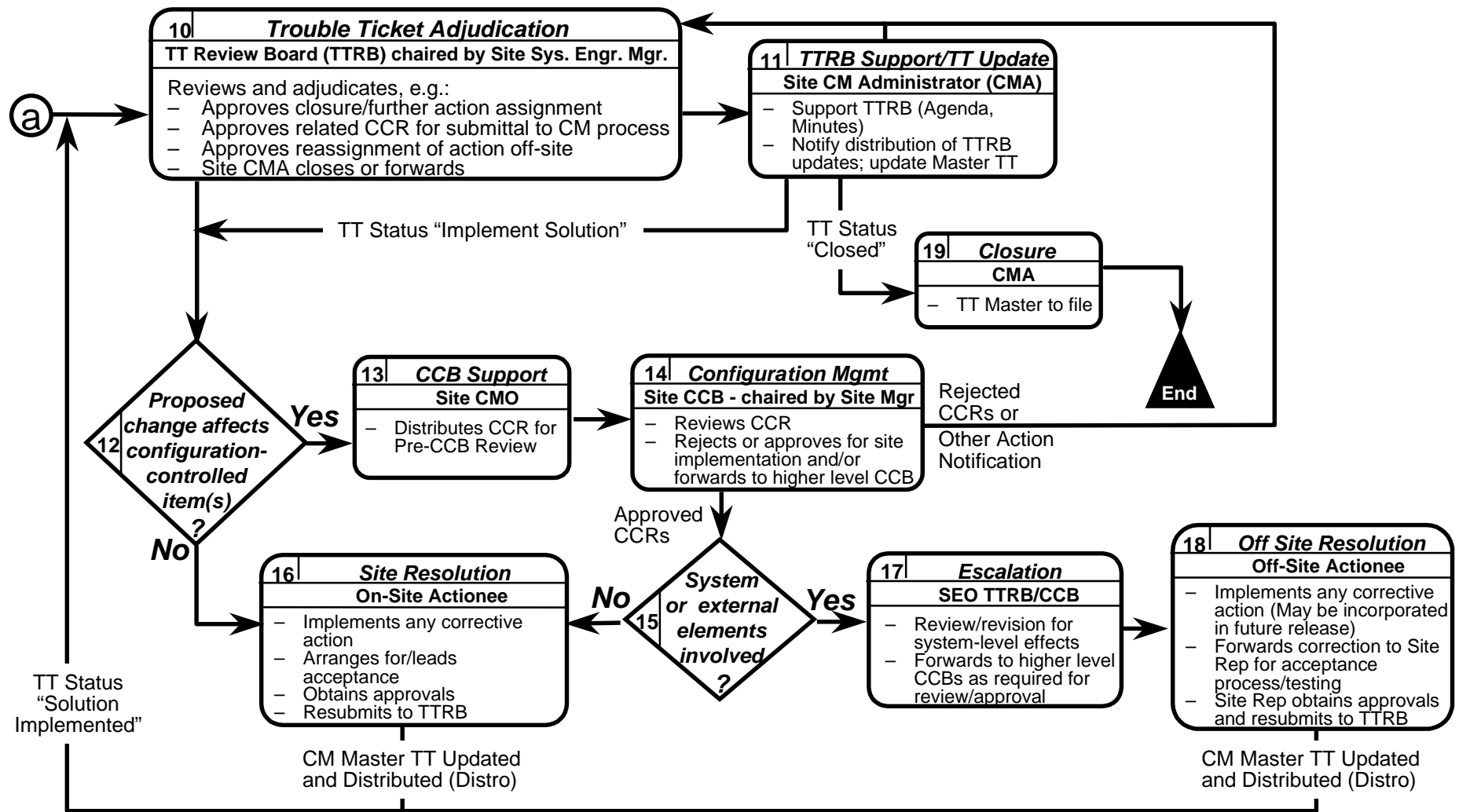
Problem Resolution (Cont.)

Problem Management Concept Pt. I

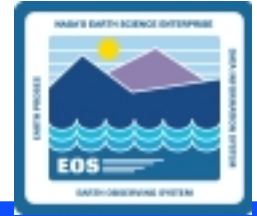


Problem Resolution (Cont.)

Problem Management Concept Pt. II

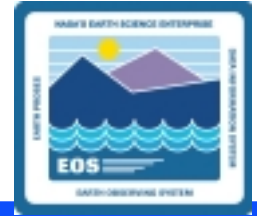


Problem Resolution (Cont.): Process



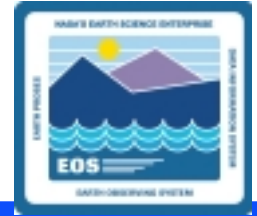
- **User/operator discovers problem (Step 1)**
- **User/operator or User Services submits a TT (Step 2)**
- **Operations supervisor decides whether or not a rapid response is required (Step 3)**
- **If rapid response is required, Operations Supervisor calls 1-800-ECS DATA (Step 4)**
- **Otherwise, Remedy logs TT into system and assigns status (“New”) to initiate administration and monitoring by the Site Configuration Management Office (CMO) (Step 5)**

Problem Resolution (Cont.): Process



- **Operations Supervisor reviews TT, assigns priority, assigns problem to Problem Investigator (PI), and changes TT status to “Assigned” (Step 6)**
- **CM Administrator notifies affected centers (if any) (Step 7)**
 - may forward TT to other center(s)
 - may send e-mail message with information
- **TT database administrator updates database with inputs (Step 8)**

Problem Resolution (Cont.): Process



- **PI coordinates inputs from various sources; presents significant issues (if any) at TT Telecon; updates TT database after finding a proposed solution to the problem; changes TT status to “Solution Proposed” (Step 9)**
- **TT Review Board (TTRB) considers problem; approves, rejects or revises proposed solution; TTRB is supported by the site CM Administrator (CMA) (Steps 10 & 11)**
- **TTRB decides whether proposed change affects a configuration controlled item and therefore needs to be referred to the CCB(s) (Step 12)**

Problem Resolution (Cont.): Process



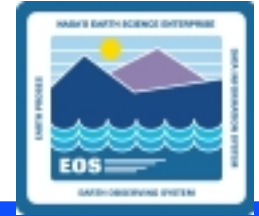
- For a configuration issue, site CMO distributes CCR for pre-CCB review (Step 13)
- Site CCB may approve, reject or revise change proposals (CCRs) (Step 14)
 - TTRB is notified of any rejected CCR and reconsiders the TT accordingly
- Site CCB decides whether system-wide or external elements are involved, necessitating referral to higher level CCB (Step 15)
- If proposed change does not affect a configuration controlled item, or if a site-approved CCR is not referred to higher level CCBs, solution may be implemented at site; TT status is changed to “Solution Implemented” (Step 16)

Problem Resolution (Cont.): Process



- If external elements are involved and/or a CCR is escalated, off-site problem resolution process is managed by the SEO TTRB (Step 17)
 - may revise a proposed solution if there are system-level effects
- Off-site resolution may include corrective action incorporated in a future release; correction is forwarded to site representative for testing/acceptance; TT status is changed to “Solution Implemented” (Step 18)
- TTRB approves closure/further action assignment; TT status is changed to “Closed” and CMA files TT Master (Step 19)

Problem Resolution (Cont.)



- **Trouble ticket and problem tracking scenario**
 - registered science end-user submits a Trouble Ticket
 - routine (non-emergency) problem
- **Problem scenario tracked through Trouble Ticket Review Board**

TT Telecon (Cont.)



- **All Category-1 and -2 problems are submitted to the TT Telecon**
 - Category 1 for review and approval
 - Category 2 for acknowledgment and advice
- **TT Telecon coordinates TT activities within M&O and with development, customer and user organizations**

TT Telecon (Cont.): TT Telecon Attendees



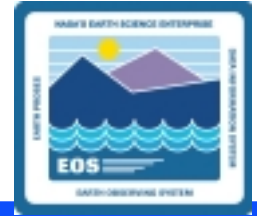
- **Customer representatives**
- **ECS M&O Manager or designee (chairs Telecon)**
- **DAAC representatives**
- **SEO engineering team leads**
- **ECS ILS engineering support representatives**
- **ECS engineering team leads and operations representatives**
- **ECS M&O support staff**
- **ECS development organization representatives**

TT Telecon (Cont.): TT Agenda/Discussion



- **Review and prioritize each TT opened at each center**
- **Review and re-prioritize older TTs (as required)**
- **Assign TT work-off responsibility to one organization**
- **Review distribution of TTs by organization, priority and age**
- **Determine which new TTs to forward to DDTS for processing as Non-Conformance Reports (NCRs) at EDF**

TT Telecon (Cont.)



- **Agenda items may be supplemented or replaced with hardcopy or softcopy reports**
- **Material from the meeting is distributed within each ECS organization and to customer and user organizations as required**

TT Telecon (Cont.)



- **TT Telecon obtains all necessary assistance to ensure thorough analysis of the problem**
 - may obtain assistance from system hardware suppliers
 - coordinates investigations and remedial actions with the appropriate project personnel from the National Aeronautics and Space Administration (NASA)
 - assures proper documentation of investigations and remedial actions
 - ensures that configuration changes (if any) are made in accordance with the configuration management procedures

TT Telecon (Cont.)



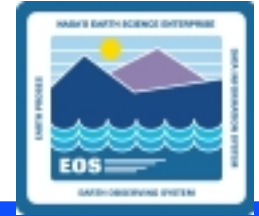
- **Conditions to be verified before a malfunction report may be closed out:**
 - remedial and preventive actions completed on item
 - preventive design changes completed and verified
 - effective preventive actions established to prevent problems with other affected items

TT Telecon (Cont.)



- **Both TT Telecon (first) and NASA must officially approve each Category-1 problem resolution to close it out**
- **Red Flag reports**
 - **are highlighted at Government assurance reviews**
 - **must have their resolution approved by both:**
 - **contractor project manager**
 - **Government EOS Project Manager**

Making Emergency Fixes



- **Procedure varies**
 - nature of the problem
 - from ECS center to ECS center
- **Issues for providing a common framework for emergency responses to crisis-level situations:**
 - contingency plans
 - points of contact
 - general guidelines
- **General process not specific procedure**
 - model process: Hardware Emergency Change Scenario (604-CD-003-002)

Making Emergency Fixes (Cont.): Hardware Emergency Change



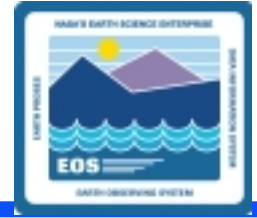
- **Operator detects problem with ATL on Saturday evening; submits a TT**
- **System administrator confirms problem; notifies site maintenance engineer**
- **Maintenance engineer confirms problem**
- **Maintenance engineer reports problem to OEM**
- **OEM maintenance representative arrives, verifies symptoms, diagnoses faulty controller card; only spare available is of a later version**

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **Maintenance engineer reports situation to operations supervisor**
- **Operations supervisor calls DAAC manager at home to report situation; DAAC manager approves board replacement with newer version contingent on acceptable testing results**
- **OEM maintenance representative installs replacement board**
- **Sustaining engineer tests new board; brings ATL back on line**

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **Sustaining engineer generates CCR to document the configuration change**
- **Maintenance engineer records board replacement on TT, referencing CCR**
- **Maintenance engineer closes TT**
- **Maintenance engineer updates TT system property record with data on new board**
- **Sustaining engineer records installation in CCR; routes CCR to CM administrator**

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **CM administrator decides whether to refer CCR to CCB**
- **CM administrator updates Baseline Manager**
- **ECS SEO/SOS reviews CCR to determine effects on ECS system and other sites**
- **ESDIS CCB receives copy of CCR for review and concurrence**
- **CM administrator closes CCR when CCB has ratified the change**

Help Desk



- **Established at EDF as single point of contact to provide quick response for critical ECS operational problems**
 - assist DAAC staffs with critical operational problems in the minimum time possible
 - document all critical operational problems and make information available via the SMC home page
 - train DAAC staffs for greater self-sufficiency
 - perform weekly trend analyses on trouble reports and report the results to ECS management
 - write Severity 1 non-conformance reports where fixes or work-arounds are not possible and the reported problem has not yet been documented
- **Access: 1-800-ECS-DATA (1-800-327-3282)**